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A TABLE OF CHARACTERS.

Fig. 1.

<i>unus</i>	<i>duo</i>	<i>tres</i>	<i>quatuor</i>	<i>quinque</i>	<i>sex</i>	<i>septem</i>	<i>octo</i>	<i>novem</i>	<i>decem</i>
<i>primus</i>	<i>secundus</i>	<i>tertius</i>	<i>quartus</i>	<i>quintus</i>	<i>sextus</i>	<i>septimus</i>	<i>octavus</i>	<i>nonus</i>	<i>decimus</i>
<i>semel</i>	<i>bis</i>	<i>ter</i>	<i>quater</i>	<i>quinquies</i>	<i>sexies</i>	<i>septies</i>	<i>octies</i>	<i>nonies</i>	<i>decies</i>

From, Gruters Antiquitat. Vol. II. in fin.

Boethius's apices.

I	6	u	q	4	E	A	8	9	10
---	---	---	---	---	---	---	---	---	----

Doctor Meads's Manuscript.

Small Greek letters.

α	β	γ	δ	ε	ζ	η	θ	ι
---	---	---	---	---	---	---	---	---

Modern Indian figures.

q	z	ε	γ	γ	3	9	τ	ε	q.
---	---	---	---	---	---	---	---	---	----

Tavernier Liv. 1. chap. 2.

Arabic figures.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Manuscripts

Figures of Jo. de sacro bosco.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Figures of Max. Planudes.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

Doctor Wallis.

Figures in Reg. Bacon's Calendar

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

The Cotton. library.

Modern fig.

1	2	3	4	5	6	7	8	9	10
---	---	---	---	---	---	---	---	---	----

THE HELMDON DATE.

Fig. 2.

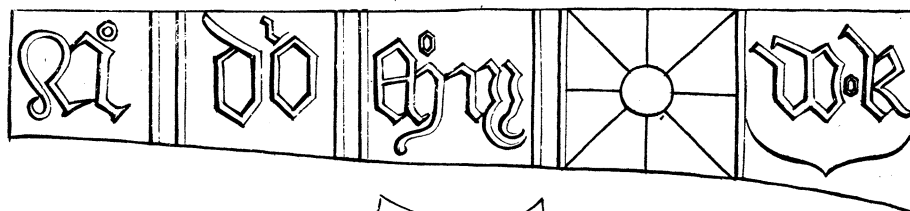
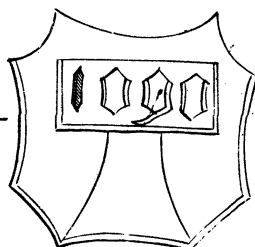


Fig. 3.

THE COL-



CHESTER DATE

II. *Remarks upon an Antient Date, found at Widgel-Hall near Buntingford in Hertfordshire, on an Oaken Plank ; now preserved in the Museum of the Royal Society, London. By John Ward, Rhet. Pr. Gresh. and F. R. S.*

UPON the fourth of *April*, 1734, a curious Draught of an antient Date, carved in an Oaken Plank, at *Widgel-Hall*, the Seat of *Francis Gulston*, Esq; was laid before an Assembly of the Royal Society, as the most early Instance of our common Figures, usually called *Arabian*, which had ever been observed in *England*. It was read *M*16, and thought to express the Year 1016, the *M* being taken for a *Roman* Numeral, and the 16 for *Arabian* Figures.

Doctor *Wallis* had, in the Year 1683, communicated to that learned Body the Draught of a Mantle-tree, somewhat like this, which he saw at the Parsonage-house at *Helmdon* in *Northamptonshire*, and got it delineated. The Date, which was likewise carved in mixed Characters, expressed the Year *M*133, as the Doctor read it. See TAB. II. Fig. 2. This being the oldest Monument of that Sort, which had then been discovered among us, was published first in the *Philosophical Transactions*^a, and afterwards in the Doctor's *Algebra*^b.

^a No. 154.

^b Cap. 4. p. 14.

And in the Year 1700 another Draught of a Date at *Colchester*, which had been sent to Doctor *Wallis* by Mr. *Luffkin*, who copied it from the under Cell of a wooden Window, and read the Figures 1090, being all *Arabian*, was printed likewise in the *Transactions*^a, as more antient than the former. See TAB. II. Fig. 3.

None earlier than these two last had since appeared, till that from *Widgel-Hall*. Upon the Sight of which, I thought the Reading given to it looked very plausible. The mixed Characters were no just Objection, which Doctor *Wallis* had accounted for in the *Helmdon* Date^b, and I have myself observed in some Manuscripts. But yet one Difficulty seemed to remain, which was the want of some Character in the Place of Hundreds. And therefore soon after going into *Hertfordshire*, I took that Opportunity to wait upon Mr. *Gulston*, in order to see the Original; who was so obliging, as not only to shew it me, but also to say, if it would be acceptable to the Royal Society, it should very readily be at their Service. I thanked him for the Offer; and promised, that if he pleased to send it to me, I would deliver it, as from him. Accordingly some Time after it came to my Hands, together with a Letter, giving an Account of the Antiquity of the Building in which it stood. And as that Letter may afford some Light to the Enquiry about the Date cut in the Plank, I take leave to send them both together.

^a No. 256.^b De Algebra, cap. 4. p. 14.

*Part of a Letter from Francis Gulston, Esq; to
Mr. John Ward.*

S I R,

I Can give you no further Account of the Antiquity of the Building, than that in general 'twas esteemed ancient. Before the House was burnt, on the Timbers there were several old Coats of Arms; some we looked on as belonging to the Family of the *Scalers*; these were Possessors of *Widdihale*^a, with other Estates, soon after the Conquest. The House, in Probability, might have been of greater Antiquity, and I believe really was; for at the Time of the Conquest 'twas in the Possession of a considerable Follower of *Harold*.

The Piece of Timber I send you, was the Top of a Door-way, in a Timber-built House, and plastered over with Mortar. From the Date on the plastered Wall, the Door had not been used at least 343 Years; for on the Outside was plainly to

^a *Widdihale* in *Hertfordshire* in the Time of the Conqueror was Parcel of the Estate of *Hardwin de Scalers*, as appears by *Domesdei Book*, fol. 141.

It continued in that Family for several Generations, till it came to *Anthony Widdihale*, by the Marriage of the Daughter and Heir of *Scalers*. But when he would not comply with *Richard* the Third to destroy the young Princes, all his Lands were seized, and the Mannor continued in the Crown, till *Henry* the Eighth granted it to *George Canon* and *John Gill*: *George Gill*, the Son of *John*, marrying the Daughter of *George Canon*, obtained the whole."

In this Family it continued till the Beginning of the Reign of *James* the First, when it was sold to *John Goulston*, Esq; whose Descendants now hold it." See *Sir Henry Chauncy's History and Antiquities of Hertfordshire*, p. 111.

be seen the Date 1390. Part of the Room this was found in, was burnt too much to repair again. And in taking down the burnt Timbers, being present myself, I accidentally saw it, and observing the Date, thought it a Curiosity, that might give to the Curious some Speculation. And as such I send it you, and am glad 'twill be acceptable to so learned a Body of Gentlemen, as the Royal Society. I am,

S I R,

Your most obedient

humble Servant,

*Woodbridge in Suffolk,
July the 14, 1734.*

Francis Gulston.

Upon considering the Characters on this Plank, and those of the other two Dates mentioned above, together with the Accounts given by learned Men of the Time when the *Arabian* Figures were first introduced into these Parts of the World, and the various Forms they have since received [See TAB. II. *Fig. 1.*] I was at last satisfied, that none of these three Dates prove they were ever used among us, in less than an hundred Years after the Reading given to the latest of them. And the Reasons which led me into this Opinion, I now beg Leave to offer, when I have first briefly inquired into their Origin and Antiquity.

Most

Most Writers, who have treated of the Rise of these Figures, have thought they came first from the *Persians* or *Indians* to the *Arabians*, and from them to the *Moors*, and so to the *Spaniards*, from whom the other *Europeans* received them. This was the Opinion of *John Gerard Vossius*^a, Mr. *John Greaves*^b, Bishop *Beverege*^c, Doctor *Wallis*^d, and many others. And the *Arabians* themselves own they had them from the *Indians*, as both Doctor *Wallis*^e and Mr. *Greaves*^f have shewn from their Writers.

But *Isaac Vossius* thought the antient *Greeks* and *Romans* were acquainted with these Figures, and that the *Arabians* took them from the *Greeks*, and the *Indians* from the *Arabians*^g. For the Proof of this he refers to *Tyro* and *Seneca's Notes*^h, and the Treatise of *Boethius De Geometria*ⁱ. But as to the Notes of *Tyro* and *Seneca*, they seem to have no Affinity with these Figures, either in the Number or Nature of them; for they are not limited to nine, but are many Times that Number, and all different in Form. Nor are they simple Signs of Numbers, but complex Characters of several Letters of those numeral Words which they stand for in the *Roman* Language, like our Short-hands; and therefore vary in their Shape, as they are designed to express Cardinals, Ordinals, or Adverbs of Number. This will appear by the *Table of Characters* prefixed to these Papers, in which I have given the

^a De Natura Art. lib. III. cap. 8. § 6. ^b De Siglis Arabum & Persarum Astronomicis, p. 2. where the Form of them may be seen.

^c Arithmet. Chronolog. lib. I. cap. 5. ^d De Algebra, cap. 3. p. 10. ^e Ibid. p. 9. ^f De Siglis Arabum, &c. ^g Observat.

ad Pemp. Mel. p. 64. ^h Vid. Grut. Inscript. Vol. II. ad fin.

Lib. I. fin. fin.

first ten of each. See TAB. II. Fig. 1. But as to what *Vossius* says concerning *Boethius*, I observed in a curious Manuscript of that Writer, now in the Library of Doctor *Mead*, nine Characters, which he tells us were invented and used by some of the *Pythagoreans* in their Calculations; while others of them made use of the Letters of the Alphabet for the same purpose. *Boethius* calls them *Apices vel Characteres*^a. I have inserted these also in the Table [TAB. II. Fig. 1.] to shew the great Affinity between them and the *Arabian* Figures, as these latter were written two or three Centuries ago.

The Opinion of *Daniel Huetius* differed from either of the former; for he imagined, the *Arabian* Figures were only the Letters of the *Greek* Alphabet corrupted and altered by ignorant Librarians^b.

From this summary Account of the Rise and Antiquity of these Figures, it seems probable to me, they might owe their Original to the *Greeks* (those common Masters of all Science) and passing from them first to the Eastern Nations, come round to these Western Parts, in the Manner before described. We have no other Author, who speaks of this matter, near so antient as *Boethius*, whose Words are very express, and much strengthened by the Similitude of his Characters with the *Arabian* Figures. And therefore we may rather suppose, they took their Rise from these, than from the small *Greek* Letters, with which *Huetius* compared them; since these latter are neither so like them, nor so old as the Time of *Boethius*. And though what the

^a Ubi supra.

^b Demonstrat. Evangel. Prop. IV c. 13. p. 172.

Arabians say may be true, that they had them from the *Indians*, and not the *Indians* from them, as *Isaac Vossius* conjectured ; yet it may be equally true, that the *Indians* had them first from the *Greeks*, and those *Arabian* Writers (who are not very antient) not have known it ; nor are there any *Indian* Monuments of sufficient Antiquity to render this Opinion questionable.

But which soever of these Sentiments may be esteemed the most credible, with respect to the Origin of these Figures ; *Joseph Scaliger* thought they were not received by the *Europeans*, as they came of later Ages from the *Arabians*, long before the Year 1300^a.

But *John Gerard Vossius* was of the Opinion they began to use them about the Middle of the thirteenth Century, or the Year 1250^b.

Father *Mabillon*, in his Treatise *De Re Diplomatica*, was necessarily led to attend to the Use of these Figures, particularly in Dates. And he informs us, that they were rarely used before the fourteenth Century, except in some few Books of Geometry and Arithmetic. And presently after he says, it was not much to his purpose to treat of them, since he did not design to carry his Work lower than the thirteenth Century^c. By which he seems to intimate, that he had met with very few, if any, Instances of *Arabian* Figures, in such Instruments at least, before the Year 1300.

But no one appears to have examined this Subject more carefully than Dr. *Wallis* ; who has of-

^a Lib. III. Ep. 223.

^b De Natur. Art. Lib. III. cap. 8. § 7.

^c Lib. II. c. 28. §. 10.

ferred some Arguments to prove, that *Gerbertus*, a Monk, who was afterwards advanced to the Papal See, and took the Name of *Sylvester II.* had before the Year 1000 learned the Art of Arithmetic, as now practised, with the Use only of nine Characters (whatsoever their Form then was) from the *Saracens* in *Spain*, which he afterwards carried into *France*^a. But the Doctor thinks those Characters or Figures were known for a long time after only to such Artists, and principally used by them in astronomical Calculations; the *Roman* Numerals being still retained in common Use to express smaller Numbers^b. Nor has he given us the Figures used by any of those Writers, before *Johannes de Sacro Bosco*, who died in the Year 1256; and *Maximus Planudes*, a *Greek*, who flourished after him; which I have copied from him, and inserted in TAB. II. Fig. 1.

Mr. *David Casley*, in his *Catalogue of the Manuscripts of the King's Library*, &c. has published a Specimen of a Manuscript from the *Cottonian Library*, called *Calendarium Rogeri Bacon*^c, and dated 1292. The Figures in this Book are *Arabian*, and, as Mr. *Casley* informed me, the oldest that he remembers to have met with in either of those Libraries: For which Reason I have given them a Place in the *Table*.

It appeared to me exceeding difficult, how to reconcile the Opinions and Observations of these several Writers, concerning the first Use of the *Arabian* Figures in these Western Countries, with the Time assigned even to the latest of the Dates above-mentioned. And it could not but seem very

^a De Algebra, c. 4. p. 17. ^b Ib. p. 11, 15, 16. ^c Plate xv.

strange, that no Date of any Writing should have been produced in those Figures, or any other Use of them discovered (except perhaps in some mathematical Calculations, or Books of Arithmetic) long before the fourteenth Century ; and yet that a Date should be found, so carved in a Piece of Wood, before the Middle of the twelfth Century, for so common a Purpose as the Mantle-tree of a Chimney.

But upon a closer Examination of the Characters, I found Reason to think, this was not really the Case ; and that instead of 1133, they ought to be read 1233, what has been taken for a 1, being designed for a 2. This Reading seems to be confirmed by the Shape of the two 33 that follow it, from which, if the bottom Curve towards the right Hand (as it was often made formerly) was taken off, the upper Part would make the 2. Which Agreement between those Figures is not only usual at present, but often found in Manuscripts of the fourteenth and fifteenth Centuries. Though sometimes indeed 'tis otherwise ; and the 2 has an Angle at the Top, when the 3 is round, which would not so well have suited this square Hand. The Reason which occasioned the carrying this Date so high, must, I presume, have been the Similitude between the small *i* over the preceding abbreviated Word *Domini* and this 2. But though they appear to have some Likeness, yet there is a manifest Difference between them ; for the 2 is much larger at the Top, where it has an Angle, and a Curve downward, that plainly distinguish it from the former. Could it be taken for a 1, I should much rather suppose it was designed for a Letter than a Figure,
and

and the two following Characters for a double *ll* ; and so the whole to be only an Abreviation of the Word *millesimo*. But as I think it must be a 2, for the Reasons given already, and do not remember ever to have met with such a double *ll*, I can't but esteem the other the true Reading. And yet still, I believe, this Date may claim the Preference of being the oldest of the Sort that has hitherto been discovered.

The Antiquity ascribed to the *Colchester* Date, namely 1090, has, it seems, been occasioned by a Mistake in the Copy ; for the 0 in the Place of Hundreds should have been made a 4, by drawing down an oblique Stroke on each Side from the Bottom, which makes it 1490, before which Time the 4 had long received that Shape. See TAB. II. Fig. 1. I am obliged for this Information to *James West, Esq*; a worthy Member of this Society, and well skilled in our *British* Antiquities, who himself perceived the Mistake in viewing the Original.

As to the Date from *Widgel-Hall*, which gave Occasion to this Enquiry, it seems to me plainly intended to express the Year 1000, and no more, by the *Roman* 99 in the Escutcheon on the right Side. For the Characters in the other Escutcheon cannot, I think, stand for Figures, but must be the initial Letters of two Names I. G. as W. R. in the *Helmdon* Date ; and were very probably designed in both to denote the Persons who erected those Buildings. The Omission of a Character in the Place of Hundreds, is still an Argument with me, that these two last were not made for Figures. But what I imagine puts the Matter past all Doubt, is the want of Evidence that the Figure 6 had received

that Form till some Ages afterward : And when it was introduced, the upper Part was not at first made so erect, as it is here, but carried in a small Arch just over the Top of the Circle, as may be seen in TAB. II. *Fig. 1.* On the other hand, what looks here like the modern 6, was at that Time the usual Form of the Capital G. This I found fully confirmed by a large Collection of original Grants, made by our antient Kings and others, and preserved in the *Cottonian Library*^a. Upon consulting these for half a Century at least, both before and after the Year 1016, I found the G so written in a great Number of them, of which the following are some few Instances : *N. 37. anno DCCCCLX. N. 35. anno DCCCCXIII. N. 53. anno MXLV. N. 49. anno MLXXXI.* For these Reasons therefore I can make no Question, but that Character was designed for a G, and not a 6. And it is plain from other Circumstances in *Mr. Gulston's Letter*, that the Building might very probably be as antient as the Year 1000 ; which renders this Relic of it, considering how firm and sound it still is, a remarkable Curiosity.

The Use which I think may be made of these Observations is this : That so far as yet appears, any Coin, Inscription, or Manuscript, with a supposed Date before the thirteenth Century, expressed in *Arabian Figures*, may be justly suspected either not to be genuine, or not truly read ; unless the Antiquity of it be certain from other clear and undoubted Circumstances, and the Date will bear no

^a Augustus II.

other Reading ; and if it be a Copy, that it has been taken with Exactness.

In TAB. II. Fig. 1 contains the several different Characters and Figures refer'd to in the REMARKS, together with the modern Indian and European Figures.

Fig. 2 is the Helmdon Date.

Fig. 3 is the Colchester Date.

III. Some Considerations on the Antiquity and Use of the Indian Characters or Figures. By Mr. John Cope.

THE most ingenious Invention of Figures by the sagacious *Indians*, is of such vast Importance in Numbering, that it can never be sufficiently enough admired, although now-a-days the Use of them is become so familiar among us, that very few consider what a Loss the want of them would be to People of every Degree and Station in Life : For to consider only, that such a Number as not long before the Conquest would take up a good Arithmetician whole Days to count by the literal Characters, is now by the Help of Figures commonly express'd by a Child in a few Minutes. This Consideration of the vast Use of Figures, put the Learned Dr. *Wallis*, and others since him, upon enquiring at what Time they were first happily introduced into this Island.

Dr. Wallis